Transformational music theory

This project is about a branch of mathematical music theory called *neo-Riemannian theory*. (This is a different Riemann to the mathematical one!). It began (as Riemannian theory) as a way to classify classical harmony using transformations of chords. Neo-Riemannian is a more recent reinvention of this work, which attempts to provide a geometrical and transformational model of musical structure, in particular revealing how harmony, counterpoint and voice-leading can be codified into geometrical spaces called orbifolds. The first stage in this project will be to understand the relevant content of the excellent blog https://alpof.wordpress.com/. We will use the Python module Opycleid to study transformational music theory, and attempt to apply ideas from the new field of complex networks to the same framework. There will be a significant amount of music theory in this project, and it will be necessary to do much numerical computation.

Pre-requisites are:

- a non-trivial amount of music theory, knowledge of Python, some group theory.
- MATH2340 The Mathematics of Music, MATH1920 Computational Mathematics, MATH2210 Intro to Discrete Maths would be very useful;
- MATH1225 Intro to Geometry, MATH3033 Graph Theory might be slightly useful.